



5. (Original) The population of labeled oligonucleotide probes of claim 1, wherein each labeled oligonucleotide probe comprises an intensity reference signal molecule.

6. (Original) The population of labeled oligonucleotide probes of claim 1, wherein each oligonucleotide is an identical length of about 10 to 50 nucleotides.

7. (Original) The population of labeled oligonucleotide probes of claim 1, wherein the signal molecules are Raman labels.

8. (Currently amended) The population of labeled oligonucleotide probes of claim 7, wherein the series of signal molecules comprise a polymethine dye or a signal molecule of ~~Table 1~~ selected from the group consisting of 2-Aminopurine, 2-Fluoroadenine, 4-Amino-pyrazolo[3,4-d]pyrimidine, 4-Pyridinecarboxaldoxime, 8-Azaadenine, Adenine, 4-Amino-3,5-di-2-pyridyl-4H-1,2,4-triazole, 6-(g.g-Dimethylallylamino)purine, Kinetin, N6-Benzoyladenine, Zeatin, 4-Amino-2,1,3-benzothiadiazole, Acridine, Basic blue 3, Methylene Blue, 2-Mercapto-benzimidazole, 4-Amino-6-mercaptopyrazolo[3,4-d]pyrimidine, 6-Mercaptopurine, 8-Mercaptoadenine (adenine thiol), 9-Aminoacridine, Cyanine dyes, Ethidium bromide, Fluorescein, Rhodamine Green, and Rhodamine-6G.

9. (Original) The population of labeled oligonucleotide probes of claim 1, wherein the signal molecules are fluorescent labels or quantum dots.





21. (Original) The method of claim 11, wherein the signal molecules are a series of nanotags.

22. (Original) The method of claim 11, further comprising contacting the target nucleic acid, or a fragment thereof, with a population of capture oligonucleotide probes bound to a substrate at a series of spot locations before contacting the target nucleic acid with the population of labeled oligonucleotide probes.

23. (Original) The method of claim 22, further comprising ligating labeled oligonucleotide probes with capture oligonucleotide probes that bind adjacent target segments of the target nucleic acid.

24. (Currently amended) A reaction mixture, comprising a target polynucleotide and a an isolated population of labeled probes, wherein each labeled probe comprises an oligonucleotide associated with a series of detectably distinguishable signal molecules, the nucleotide sequence of each oligonucleotide being represented by the number and type of signal molecules associated with the oligonucleotide, wherein the number of probes exceeds the number of unique signal molecules, wherein the type of nucleotide at each position in at least one of the labeled probes is identified by an intensity of at least one of the unique signal molecules.

25. (Original) The reaction mixture of claim 24, wherein each unique signal molecule is present up to 4 times per labeled oligonucleotide probe.

26. (Original) The reaction mixture of claim 25, wherein the number of unique signal molecules is equal to the number of nucleotides of the labeled oligonucleotide probe.

27. (Canceled)

28. (Original) The reaction mixture of claim 24, wherein each labeled oligonucleotide probe comprises an intensity reference signal molecule.

29. (Original) The reaction mixture of claim 24, wherein each oligonucleotide is an identical length of about 10 to 50 nucleotides.

30. (Original) The reaction mixture of claim 24, wherein the population of labeled oligonucleotide probes comprises all possible sequence combinations of an oligonucleotide of the identical length.

31. (Original) The reaction mixture of claim 24, wherein the signal molecules are Raman labels.

